

## WHAT IS CLAIMED IS:

1. A coplanar line comprising:

a first layer of dielectric material;

5 a second layer of dielectric material positioned adjacent to said first layer of dielectric material, said second layer of dielectric material having a dielectric constant that is less than the dielectric constant of said first layer of dielectric material;

10 first and second electrodes for applying a controllable voltage across said first dielectric material, thereby controlling a dielectric constant of said first dielectric material, wherein at least one of said electrodes is positioned between said first and second layers of dielectric material;

a conductor positioned adjacent to a first edge of each of said first and second layers; and

first and second ground planes positioned on opposite sides of said conductor.

2. A coplanar line as recited in claim 1, further comprising:

15 means for applying a controllable voltage across said second dielectric material, thereby controlling a dielectric constant of said second dielectric material.

3. A coplanar line as recited in claim 1, further comprising:

20 a plurality of additional layers of dielectric material positioned generally parallel to said first and second layers of dielectric material, and at least selected ones of said additional layers of dielectric material having a tunable dielectric constant.

4. A coplanar line as recited in claim 3, wherein said first, second and additional layers are assembled into a plurality of subassemblies, said subassemblies being substantially identical to each other.

25 5. A coplanar line as recited in claim 1, wherein said first layer of dielectric material has dielectric constant greater than about 100 and a loss tangent of less than about 0.01.

30 6. A coplanar line as recited in claim 1, wherein said second layer of dielectric material comprises one of: a  $\text{Ba}_{1-x}\text{Sr}_x\text{TiO}_3$  composite where x ranges from zero to one, alumina, mica, and air.

7. A coplanar line as recited in claim 1, wherein said first and second layers comprise one of the group of: bulk, tape, thick film and thin film layers.

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8. A coplanar line as recited in claim 1, wherein said first and second layers each have a thickness less than about one tenth of the wavelength of a radio frequency signal to be transmitted through the coplanar line.

9. A coplanar line as recited in claim 1, wherein said first layer of dielectric material comprises one of: BSTO, BSTO-MgO, BSTO-MgAl<sub>2</sub>O<sub>4</sub>, BSTO-CaTiO<sub>3</sub>, BSTO-MgTiO<sub>3</sub>, BSTO-MgSrZrTiO<sub>6</sub>, or a combination thereof.

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